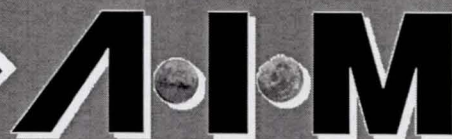
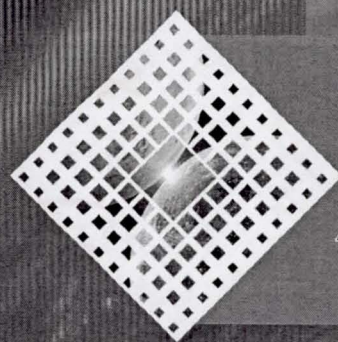


PI Informational Briefing



Heather Paul

January 2004 *ADVANCED INTEGRATION MATRIX* Habitation 2004 Conference

Mission Needs Statement

Our success will be measured by the extent to which early ground-based testing of mission capability identifies successful system implementations and operations, hidden risks and hazards, unexpected system and operations interactions, mission mass and operational savings, evaluates solutions to requirements-driving questions, and enables NASA to develop more effective, lower-risk systems and more reliable cost estimates for future exploration missions.

SCOPE



- Two primary functions
 - Develop, test, and validate the integration of mission systems for long-duration human exploration missions
 - Develop and test baselines for mission operations protocols and procedures
- Activities
 - Develop solutions & requirements
 - Evaluate systems
 - Validate solutions & requirements

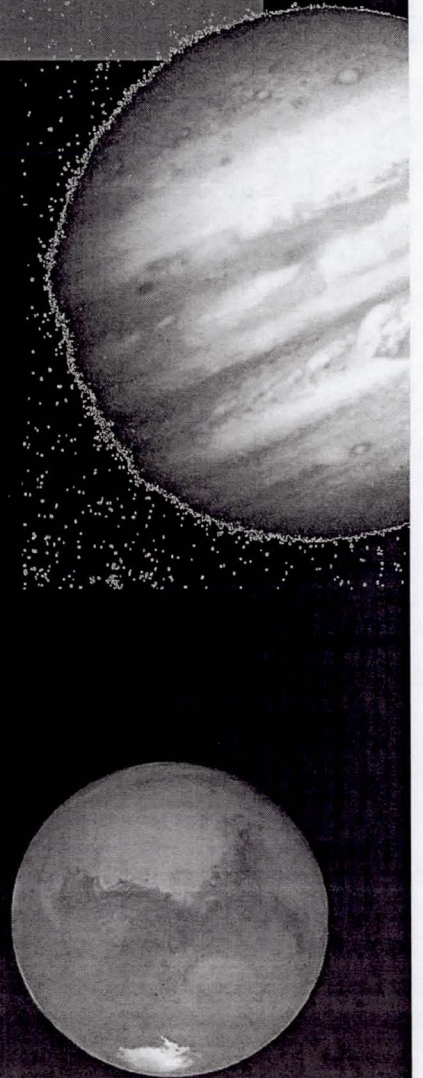


GENERAL OBJECTIVES & EXPECTATIONS

- Solve system-level integration and interface issues
- Investigate bioastronautics systems
- Investigate common issues
- Develop scalable solutions
- Support agency commitment to an exploration mission
- Be an agency strategic resource

TECHNICAL APPROACH

- A system is more than the sum of its parts
 - Collect individual projects into an integrated test environment
 - Study and optimize system-level interactions
- Start small and expand
 - Technology validation
 - Baselines for further development
 - Breakthrough concepts
- May utilize Bioastronautics Laboratory (BAL)
- Distinct from existing analog sites

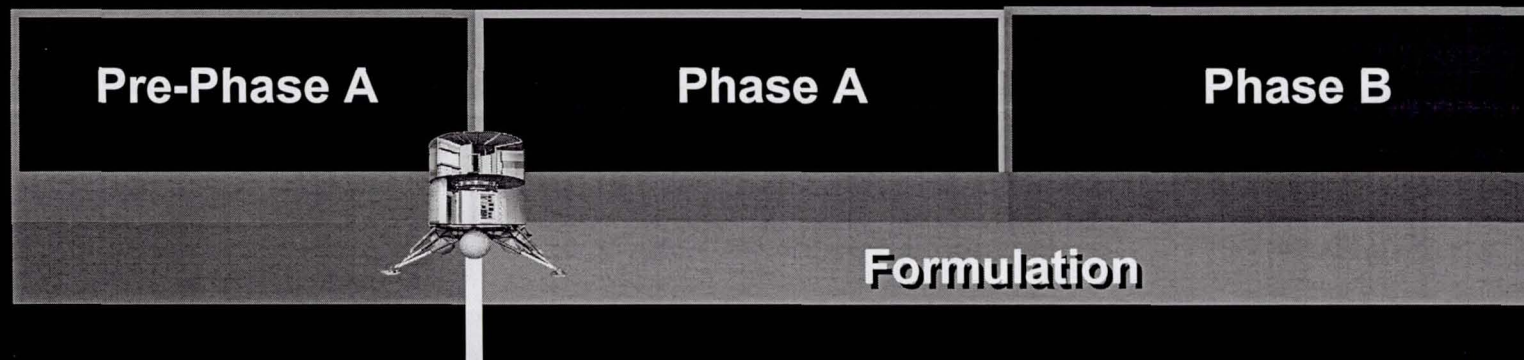


AIM IS AN AHST ELEMENT

Examples of shared risks and critical questions with other AHST Elements

	AHST Element	AIM	Examples of Potential Integration Areas
Advanced Environmental Monitoring & Control	AEMC		Control systems architecture requirements & integration
Advanced Life Support	ALS		Crop growth, processing & storage, autonomous operations
Space Human Factors Engineering	SHFE		Human engineering, operational systems and processes effects on human performance
Advanced Extravehicular Activity	AEVA		Surface dust, EVA communications, pre-breathe (ALS)
Advanced Food Technology	AFT		Food preparation impacts on life support systems loads; tracking food inventory; processing & crew time; etc.

PHASE A / FORMULATION PRODUCTS



- Project plan and schedule
- Project budget estimate
- Trade studies and analyses
- Project systems engineering definition
- “One NASA” partnership communications
- Project and mission risk assessment and management plans
- Education outreach implementation
- Benchmark test

PHASE B / FORMULATION PRODUCTS



- Implementation plan for integration tests
- Preliminary systems engineering designs
- “One NASA” partnership
- Project support solicitation
- Continuing education outreach implementation
- Feasibility test

TEST FLOW PLAN

Benchmark Test

Objectives:

- Bring in partners & technology
- Evaluate our study process
- Develop project metrics for success

Feasibility Test

Objectives:

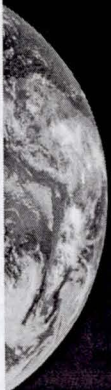
- Demonstrate feasibility of our project concept
- Expand integration scope
- Reveal unknowns & refine/direct development
- Demonstrate the project value
- Reveal and demonstrate the project metrics

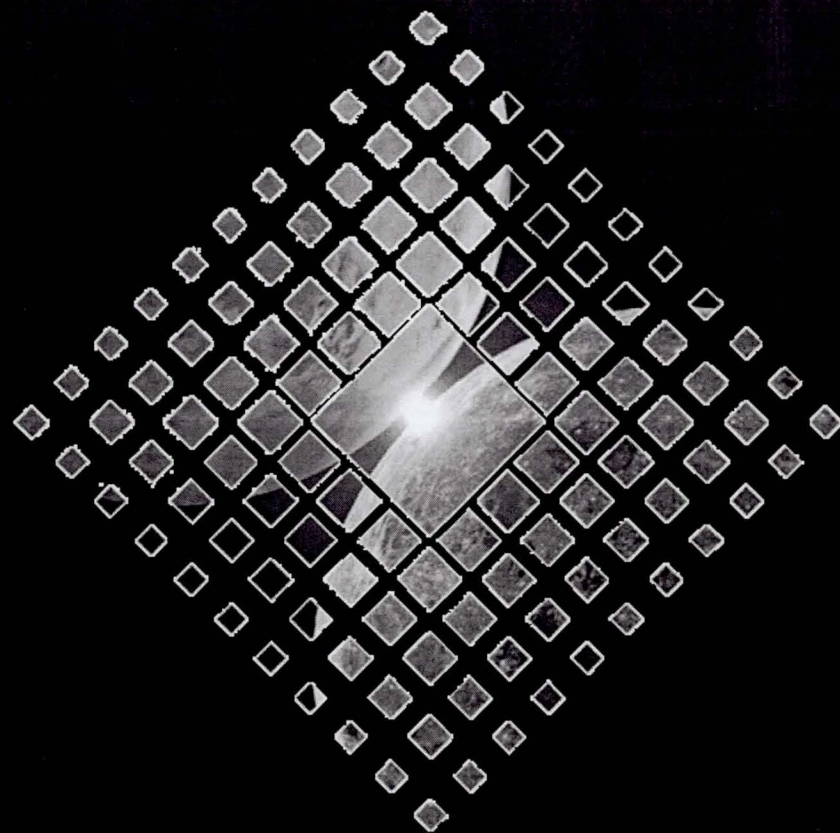
BENCHMARK TEST

- Purpose
 - Evaluate integration of hardware, software, procedures, and processes
 - Evaluate trade and test processes
 - Perform necessary and useful test
- Integrate 3-5 SETO areas
 - Hardware of TRL 3 to 6
 - Preliminary operation/procedural concept
- Inexpensive and succinct
- Preliminary TRD/TPD: March 2004
- Test: Fall of 2004

BENCHMARK TEST

- Teams are being formulated to investigate integration issues
 - CHeCS and ECLSS commonality issues
 - Control issues and computer system architectures
 - Modeling and simulation plans/issues
- Soliciting participants





AIM